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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/790,191  | 03/02/2004  | Sang-Won Ha          | 053933-5063         | 2955             |
| 9629  | 7590        | 02/13/2006           | EXAMINER            |                  |
| MORGAN LEWIS & BOCKIUS LLP<br>1111 PENNSYLVANIA AVENUE NW<br>WASHINGTON, DC 20004 |             |                      | TALBOT, BRIAN K     |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 1762                |                  |
| DATE MAILED: 02/13/2006   |             |                      |                     |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/790,191

Applicant(s)

HA ET AL.

Examiner

Brian K. Talbot

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 5-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/5/05 has been entered.
2. Claims 1-4 have been canceled. Claims 5-9 remain in the application.
3. In light of the amendment filed 12/5/05, the 35 USC 103 rejections have been withdrawn, however, the following rejections have been necessitated by the amendment.
4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Rejections - 35 USC § 112***

5. Claims 8 and 9 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for forming the waveguides or optical fibers embedded in epoxy with the use of fixing jigs and removal thereof, does not reasonably provide enablement for forming the waveguides or optical fibers embedded in epoxy without the use and removal of

the jigs. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

***Claim Rejections - 35 USC § 103***

6. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okayasu (6,257,771) in combination with Delbare et al. (5,253,310) or Noddings et al. (2003-0053770) further in combination with Ma et al. (6,865,307).

Okayasu (6,257,771) teaches an optical/electrical hybrid wiring board and its manufacture. An optical fiber-embedded layer is provided as one layer of a multiple-layered electrical wiring board. The optical fiber embedded layer (25) is shown in Fig. 5. An adhesive material is applied to one side of the insulating sheet (22) to form an adhesive layer (23). Optical fibers are laid in a pattern on the adhesive (23). Upon completion of the fiber laying, a filler material (25A) is applied to form an embedded filler material with fibers.

Okayasu (6,257,771) fails to teach forming the fiber embedded structure by laying the fibers in a jig and dipping in epoxy to form the structure along with pressure and temperature.

Delbare et al. (5,253,310) teaches an optical coupling structure whereby a structure (8) with grooves (10) is utilized to hold optical fibers in a predetermined array prior to embedding the fibers with a liquid epoxy and curing (col. 4, line 50 – col. 5, line 30).

Noddings et al. (2003-0053770) teaches fabrication of optical devices and assemblies whereby optical fibers or waveguides are formed, cladding layer is applied, and the structure is

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encapsulated with an epoxy material. Pressure and temperature is used to for the structure. In Fig. 9, grooves (906) are formed in a substrate to hold the optical fibers (204) in place prior to the encapsulation material.

Therefore, it would have been obvious for one skilled in the art at the time the invention was made to have modified Okayasu (6,257,771) process by incorporating a optical fiber holder as evidenced by Delbare et al. (5,253,310) or Noddings et al. (2003-0053770) with the expectation of controlling the arrangement of the embedded fibers during the embedding process.

Okayasu (6,257,771) in combination with Delbare et al. (5,253,310) or Noddings et al. (2003-0053770) fails to teach removing the fixing jig after embedding.

Ma et al. (6,865,307) teaches a similar process whereby optical fibers are embedded in epoxy by a molding mold and after embedding the molding mold is removed (abstract).

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Okayasu (6,257,771) in combination with Delbare et al. (5,253,310) or Noddings et al. (2003-0053770) process by incorporating a removing step of removing the jigs after embedding as evidenced by Ma et al. (6,865,307) with the expectation of achieving similar success.

While the Examiner acknowledges the fact that the prior art is silent with respect to the embedding process by dipping or rolling , it is the Examiner position that this process is a well known effective way to produce composite structures as is disclosed. The prior art teaches injecting the encapsulating material in a mold that would also produce the desired product. It is the Examiner's position that one skilled in the art at the time the invention was made would have

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had a reasonable expectation of achieving a similar product regardless of which conventional embedding means is utilized absent a showing of unexpected results. If Applicant disagrees, Applicant is invited to supply a showing of unexpected results and upon such a showing, the Examiner will reconsider his position regarding the obviousness of the coating technique utilized.

Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okayasu (6,257,771) in combination with Delbare et al. (5,253,310) or Noddings et al. (2003-0053770) further in combination with Yang et al. (6,489,012).

Features described above are incorporated here.

Okayasu (6,257,771) in combination with Delbare et al. (5,253,310) or Noddings et al. (2003-0053770) fail to teach the use of attaching members on the prepreg prior to cladding.

Yang et al. (6,489,012) teaches adhesive means are interposed between a plurality of copper clad laminates and each of the adhesive means comprises a clad laminate and prepreg layer formed on both surfaces of the clad laminate. The use of the adhesive layer prior to the cladding layer reduces thickness variation and defects (abstract).

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Okayasu (6,257,771) in combination with Delbare et al. (5,253,310) or Noddings et al. (2003-0053770) process by incorporating adhesive/cladding layers and pressing to form the circuit board with the expectation of achieving the advantages associated therewith as evidenced by Yang et al. (6,489,012).

*Response to Amendment*

7. Applicant's arguments filed 12/5/05 have been fully considered but they are not persuasive.

Applicant argued that the prior art fails to teach the removal of the jigs after embedding process.

Ma et al. (6,865,307) teaches this limitation.

Applicant argued that the prior art failed to teach "attachment members" on the prepreg prior to the cladding layer.

Yang et al. (6,489,012) teaches this limitation.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K. Talbot whose telephone number is (571) 272-1428. The examiner can normally be reached on Monday-Friday 6AM-3PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 2/9/06

Brian K Talbot  
Primary Examiner  
Art Unit 1762

BKT